

Louisiana's Nonpoint Source Annual Report

2005



**Prepared and Submitted by the
Louisiana Department of Environmental Quality**

Louisiana Nonpoint Source
Pollution Management Program

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Executive Summary

During 2005, the State of Louisiana has dealt with catastrophic impacts resulting from Hurricanes Katrina and Rita. The scale and magnitude of these storms were the largest in the nation's history. More than 1000 people lost their lives, billions of dollars of property were destroyed and more than half of the population of New Orleans was displaced throughout the country.

However during this national disaster, state and federal employees, local parish government and residents worked tirelessly under difficult conditions to first rescue people, and then initiate the collection of water quality data to assess the impacts these storms had on water quality and aquatic life. The data indicates that impacts to Lake Pontchartrain were minimal and short-lived and that coastal waters sustained their ability to produce healthy fisheries.

Communities are in the process of planning their rebuilding efforts. As communities begin to rebuild, the opportunity exists for more environmentally sensitive development practices to be implemented. As it is especially difficult to retrofit urban areas to make environmental improvements, this rare opportunity to improve local stormwater management can be realized with proper education and assistance.

There are still many challenges facing the state as a result of the hurricanes, but progress has been made in implementing the state's NPS Management Plan. Despite the large amount of resources allocated to hurricane cleanup and recovery, LDEQ has continued to sample waterbodies for assessment and Total Maximum Daily Load (TMDL) development, written watershed implementation plans, implemented BMPs, and educated the public regarding nonpoint source issues.

As we begin 2006, we focus on new challenges of restoring our coastal wetlands, rebuilding cities and communities destroyed by Hurricanes Rita and Katrina, implementing the Governor's Water Quality Goals and continuing to develop water quality improvement strategies for the 303(d) listed water bodies where TMDLs have been developed.

Louisiana's Nonpoint Source Pollution Program

The Louisiana Department of Environmental Quality (LDEQ) is the state's lead agency for planning and managing nonpoint source related activities. Nonpoint sources of water pollution are those which do not discharge through a point source, but instead flow freely across exposed surfaces. The state of Louisiana has identified agriculture, resource extraction, silvicultural activities, and runoff from urban areas and construction sites as nonpoint sources of water pollution in the state.

Highlights from the state's activities and efforts to assess waterbodies and reduce or prevent NPS pollution through education, implementation, and demonstration projects during 2005 include:

- Developed 13 Watershed Plans for targeting implementation for the 303(d) listed waters in the Ouachita River Basin;
- Drafted 7 watershed implementation plans for the impaired waterbody subsegment(s) with Total Maximum Daily Loads (TMDLs) located in the Barataria Basin;
- Approved 13 new nonpoint source project related contracts;
- Received EPA approval of eight project final reports;
- Drafted a model landscaping code for communities in Louisiana;
- Drafted a best management practice (BMP) manual for the sand and gravel industry;
- Developed a new nonpoint source website;
- Monitored and managed the spending of over \$6.8 million of Section 319 grant money;
- Received an additional \$4 million in Federal 319 Grant Funds for project implementation during the next three years;
- Hosted a Surface Water Quality Conference in Lafayette on LDEQ's Water Quality Management which was attended by more than 200 people;
- Received recognition in ArcNews, which is an international publication, for innovative GIS techniques for creating watershed implementation plans;
- Improved quality control and time management;
- Created a quality assurance project representative position to focus on quality assurance project plans (QAPPs);
- Created an upper level scientist position to specialize in nonpoint and TMDL issues;
- Designed a comprehensive sampling program and sampled 18 sites for the Barataria/Terrebonne Basin Use Attainability Analysis and TMDL Development;
- Verified metal concentrations in seven waterbodies using clean techniques;
- Awarded a national *Targeted Watershed Project* for the Tangipahoa River;
- Signed the Agreement for the Conservation Reserve Enhancement Program (CREP) for \$121 million for the Bayou Macon and Boeuf River Watersheds;
- Participated in the Advisory Panel to the Governor's Office on preserving and managing Louisiana's Cypress-Tupelo Coastal Forests;
- Participated in the State Coastal Wetland Authority to Support the Louisiana Coastal Restoration Program.

LDEQ has enjoyed continued support in efforts to reduce nonpoint source pollution throughout the state. Federal, state, and local governments, as well as universities and independent watershed groups, are working with LDEQ to improve the quality of water in Louisiana and help reach the Governor's goal of restoring the "fishable-swimmable" uses in 25% of the state's impaired waters by 2011.

Program Enhancements and Coordination

Two new positions were added to the Louisiana Department of Environmental Quality's Nonpoint Source Unit to enhance program coordination. Stephanie Morel was transferred to the LDEQ Nonpoint Unit from the Standards and Assessment Unit to serve as a Quality Assurance Representative. Her primary duties are to review and comment on Quality Assurance Project Plans (QAPPs) from the seventeen nonpoint projects which involve data collection, to correspond with EPA regarding the QAPPs, and to keep nonpoint project managers and cooperators informed of QAPP requirements. From the time she began in July, she has sent and received approval from EPA for five QAPPs, sent four additional QAPPs to EPA for approval, and been assigned two 319 projects to manage. Stephanie has also improved quality control and time management through the development of form letters and merge documents for routine correspondence and updated existing and created new standard operating procedures (SOPs).

There was a need for a senior level scientist to serve as a liaison between the Nonpoint Source Unit, upper level LDEQ management, and other state agencies if Louisiana is to achieve the Governor's goal of restoring 25% of Louisiana's impaired waterbodies by 2011. With over 15 years experience in the Nonpoint Unit, Jan Boydstun has been promoted to this new Senior Scientist position. John James Clark has been promoted from the Nonpoint Unit staff to Nonpoint Supervisor replacing Jan in that position.

Funds Expended for the NPS Program in 2005

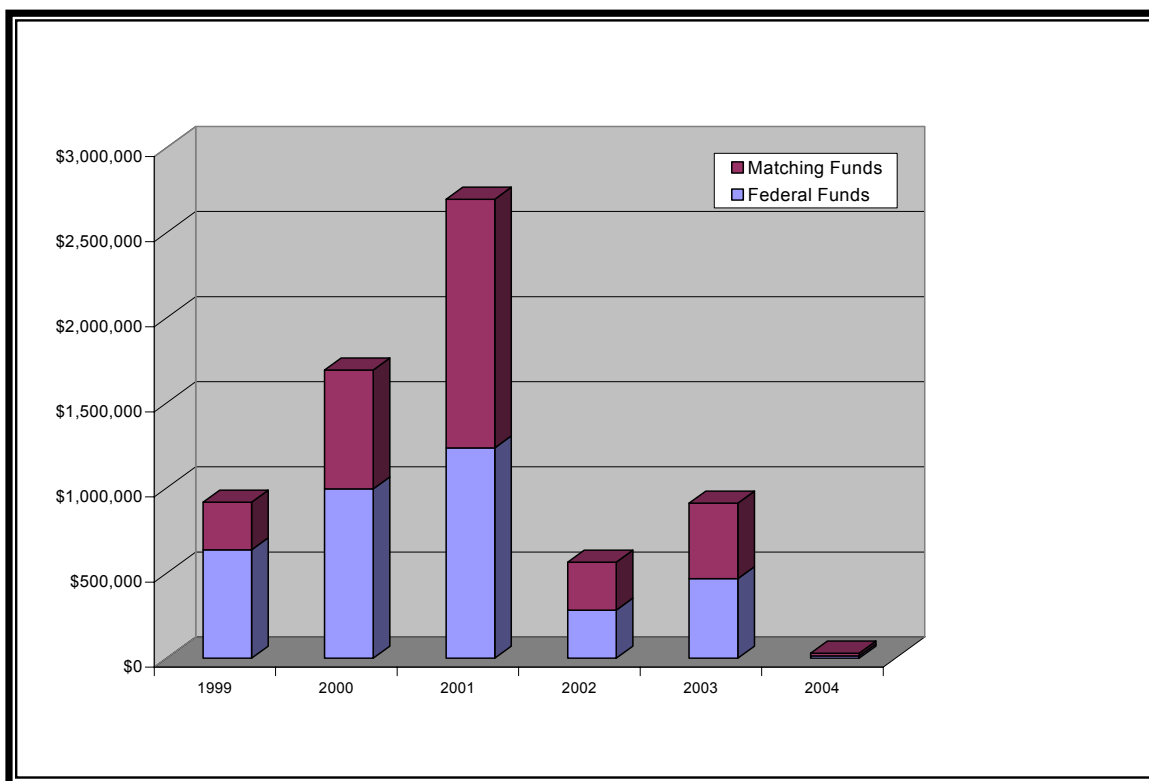
Section 319(h) of the Clean Water Act (CWA) established an annual grant that congress awards to EPA for allocation to the states to be used for implementation of activities supporting the congressional goals of the act. Louisiana's allocated funds are split between LDEQ and the Louisiana Department of Agriculture and Forestry (LDAF). The funds which are received by LDAF are strictly used for the implementation of agriculture and forestry BMPs in watersheds for which watershed implementation plans have been completed.

The funds which are awarded to LDEQ are available for a wider range of activities than those awarded to LDAF. LDEQ's portion of the grant is used to fund specific nonpoint source reduction, evaluation, or education projects and to help fund program management activities. Program management activities include assessment of the state's waterbodies, TMDL development, and GIS support.

The Louisiana Department of Environmental Quality expended over \$6.8 million of Section 319 funds during calendar year 2005 (table 1) to implement over 40 projects directed at reducing nonpoint source pollution and improving water quality. Of these funds, \$3,628,666 were federal funds and \$3,180,756 were provided as matching funds. For grant years 1999 – 2001, LDEQ was responsible for both the base and incremental funds. Beginning with the 2002 grant, incremental funds were awarded directly to the Louisiana Department of Agriculture and Forestry while LDEQ continues to manage the base funds. The transfer of the incremental funds explains the decrease in the LDEQ Section 319 grant expenditures from grant year 2001 to grant year 2002.

Table 1: LDEQ Section 319 grant expenditures in calendar year 2005

Grant Year	Federal	Match	Total
1999	\$637,102	\$278,729	\$915,831
2000	\$993,966	\$699,500	\$1,693,466
2001	\$1,235,598	\$1,460,697	\$2,696,295
2002	\$282,444	\$281,101	\$563,545
2003	\$466,663	\$444,160	\$910,823
2004	\$12,893	\$16,569	\$29,462
Total	\$3,628,666	\$3,180,756	\$6,809,422



PROGRESS IN MEETING NPS MANAGEMENT MILESTONES

The state's NPS Management Plan contained a 15-year timeline to meet water quality standards for each of the water bodies that was included on the 303(d) list of impaired waters. During 2005, the state has adhered to that timeline by implementing projects and programs to reduce nonpoint source pollutants in the *Mermentau*, *Vermilion-Teche*, *Calcasieu*, and *Ouachita River* basins. Specific details of these projects are provided within the respective sections of this report. Additionally, final watershed implementation plans were completed in the Ouachita River Basin where BMP implementation is well underway, and draft watershed plans have been written for the Barataria Basin. Detailed land-use classification was also completed for both the Barataria and Terrebonne Basins. TMDLs are being developed for the Terrebonne Basin and water quality surveys have been completed on four waterbodies in the Red and Sabine Basins. Watershed plans have been completed for the Ouachita River Basin and projects have been implemented there with Section 319 funds and USDA Farm Bill dollars to address the types of nonpoint source problems that exist in that part of the state.

Other progress during 2005 includes a revision of the state's NPS Management Plan and the creation of a new LDEQ NPS Program website that describes the work that has been accomplished through Section 319 of the Clean Water Act. The NPS Program expanded its personnel to include two new staff positions; a quality assurance project officer and a Senior Scientist. These two new positions emphasize the importance placed on quality assurance for all data collection and the need for a sound scientific basis for all of the NPS projects and programs that are being implemented throughout the state.

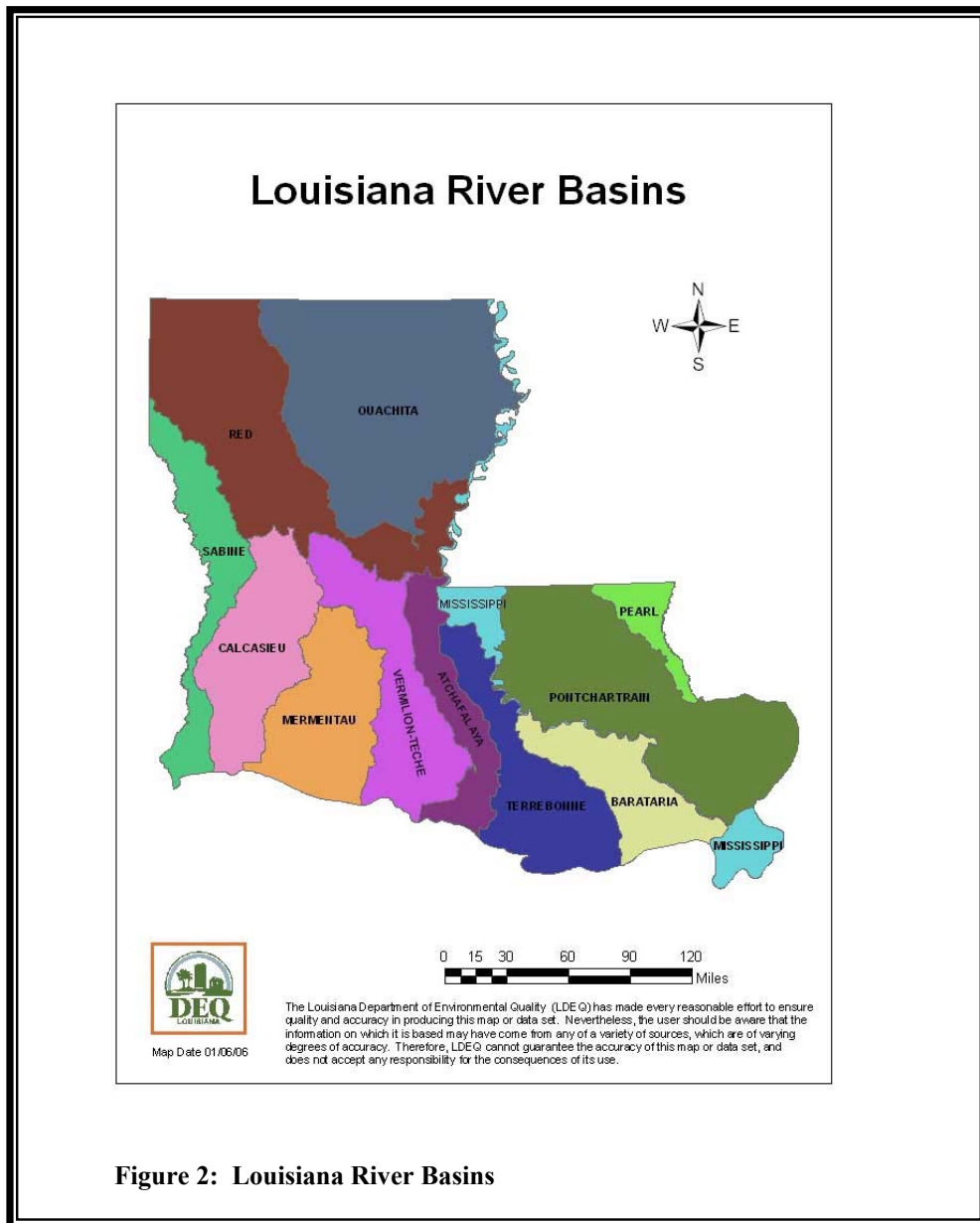
Table 2. Revised Schedule of Milestones for Louisiana's NPS Management Program

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Mermentau																			
Vermilion																			
Calcasieu																			
Ouachita																			
Barataria																			
Terrebonne																			
Pontchartrain																			
Pearl																			
Red																			
Sabine																			
Mississippi																			
Atchafalaya																			

- 1- Black Stripes = Collect Water Quality Data to Develop Total Maximum Daily Loads (TMDLs) and to Track Water Quality Improvement at the Watershed Level **[Objective 1]**
- 2- Light Grey = Develop Total Maximum Daily Loads for the Watersheds on the 303(d) List **[Objective 2]**
- 3- Green = Develop Watershed Management Plans to Implement the NPS Component of the TMDL **[Objective 3]**
- 4- Yellow = Implement the Watershed Management Plans **[Objectives 4-8]**
- 5- Blue = Develop and Implement Additional Corrective Actions Necessary to Restore the Designated Uses to the Water Bodies **[Objectives 9-10]**

Watershed Implementation

One of the strengths of Louisiana's NPS Program is the watershed planning and implementation strategy. This strategy utilizes TMDLs combined with detailed land-use classification from satellite imagery and watershed modeling. During 2005, 13 watershed plans were finalized for the Ouachita River Basin and satellite imagery classification was completed for the Barataria and the Terrebonne Basins. This watershed planning process was highlighted in an international publication, *Arc-News*. These watershed plans are the basis for implementing nonpoint source projects by both LDEQ and the Louisiana Department of Agriculture and Forestry's (LDAF's) Office of Soil and Water Conservation. The incremental component of the Section 319 grant is utilized for implementing BMPs in these watersheds where TMDLs and watershed plans have been completed.



Ouachita River Basin

The Ouachita River Basin is located in the northeastern part of the state and is comprised of two major different types of land-use: row crop agriculture and forestry. The Ouachita River bisects the basin, with the eastern quadrant being primarily row crop agriculture and the western quadrant being forestry and pastures.

Approximately 23 TMDLs were completed by LDEQ and EPA Region 6 in 2002 and 2003 for the impaired water bodies within the Ouachita River Basin. Nonpoint source pollutant loading was identified as the primary factor that

contributed to the water quality impairments in this river basin with a range of load reductions from 50 to 100% to meet water quality standards. In order to determine how those loads could be reduced, LDEQ's NPS Unit staff worked on 7 watershed plans and contracted with the USDA-Agricultural Research Service on 6 plans.

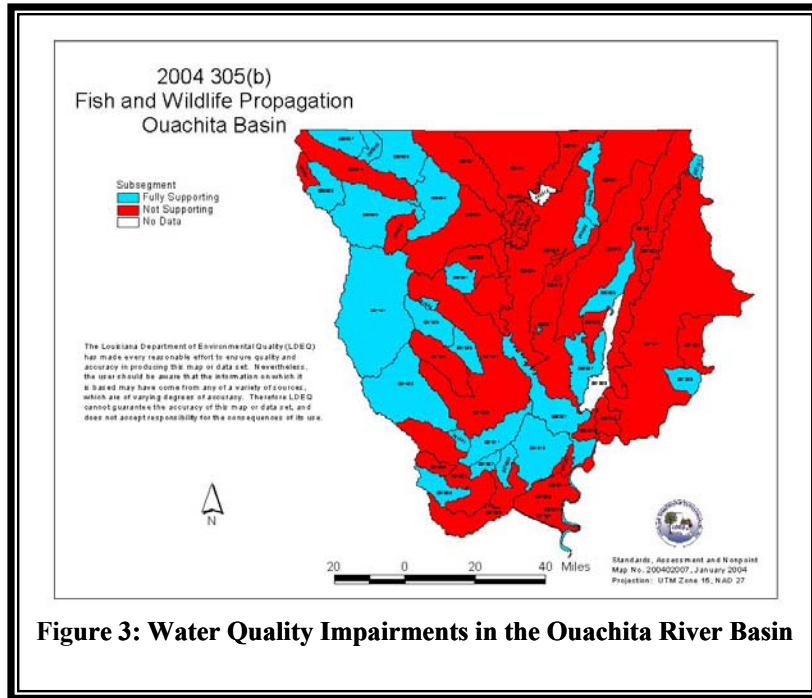


Figure 3: Water Quality Impairments in the Ouachita River Basin

Project Implementation

During 2005, Section 319 funds were utilized to implement 6 projects within the Ouachita River Basin to reduce the types of pollutants that were identified as contributing to these water quality impairments. Section 319 funds were provided to the Northeast Delta Resource Conservation and Development District to work with eight technicians that assist farmers and landowners within a 12-parish area to implement BMPs. This project has resulted in 3,166 conservation plans being developed for landowners, farm producers and local units of governments within the eastern half of the Ouachita River Basin. An extensive list of BMPs has been implemented in 2005 through this program.

Technical Assistance Project in the Eastern Ouachita River Basin

<u>Best Management Practices</u>	<u>Ac./No./Ft/</u>	<u>Acres Benefited</u>
Access Road	26,952'	996.3 Acres
Bottomland Hardwood Planting	1,055.1 Acres	1,055.1 Acres
Composting Facility	11	151.6 Acres
Conservation Cover	151.9 Acres	151.9 Acres
Conservation Crop Rotation	3,381.5 Acres	3,381.5 Acres
CREP	290.7 Acres	290.7 Acres
Critical Area Planting	30.2 Acre	268.3 Acres
Dike	26,818'	1,813.3 Acres
Establishment of Native Grasses	31.2 Acres	31.2 Acres
Establishment of Permanent Wildlife Habitat	236.2 Acres	236.2 Acres
Fence	240,975.6'	6,637.8 Acres
Field Border	43,275'	750.7 Acres
Filter Strip	105.6 Acres	461 Acres
Firebreak	26,700'	786.9 Acres
Fish Pond Management	1.1 Acres	1.1 Acres
Flume Ditch	7,000'	60 Acres
Food Plots	13 Acres	385.8 Acres
Forest Site Preparation	283.5 Acres	283.5 Acres
Grade Stabilization Structure	196	11,914.6 Acres
Grassed Waterway	61,075'	2,515.5 Acres
Green Manure and Cover Crop	6,583.8 Acres	6,583.8 Acres
Heavy Use Area Protection	64	2,728.5 Acres
Irrigation System Conveyance	120,855.8'	10,903.3 Acres
Land Smoothing	98.5 Acres	83.5 Acres
Native Grass Establishment	64.2 Acres	64.2 Acres
Nutrient Management	1,153.7 Acres	1,153.7 Acres
Pasture & Hayland Planting	1,859.8 Acres	1,859.8 Acres
Pipeline	64,889'	3,913.6 Acres
Pond	8	862.4 Acres
Precision Land Forming	644.2 Acres	644.2 Acres
Prescribe Burning	52 Acres	52 Acres
Prescribe Grazing	3,153.7 Acres	3,153.7 Acres
Range Planting	80 Acres	80 Acres
Residue Management- Ridge & Strip Till	2,948.5 Acres	2,948.5 Acres
Residue Management, Mulch-Till	175 Acres	175 Acres
Residue Management, No-Till	806.2 Acres	806.2 Acres
Residue Management, Seasonal	2,397.3 Acres	2,397.3 Acres
Riparian Buffer	1,046.5 Acres	1,046.5 Acres
Serpentine Slough	10,909'	150 Acres
Shallow Water Area Management	1,230.4 Acres	5,730.1 Acres
Structure for Water Control	30	2,866.8 Acres
Surface Drainage Main or Lateral	21,968'	1,529 Acres
Tree/ Scrub Establishment	18,810.1 Acres	24,133.5 Acres
Trough or Tank	21	1,176.2 Acres
Upland Wildlife Habitat Management	16,117.9 Acres	20,422.7 Acres
Water Well	6	641.8 Acres
Well Decommissioning		
Wetland Enhancement	1,607.7 Acres	1,607.7 Acres
Wetland Restoration	15,469 Acres	15,469 Acres
Wetland Wildlife Habitat Management	26,512.6 Acres	26,512.6 Acres
Wildlife Food Plots	274.6 Acres	1,196.7 Acres
WRP Wildlife Openings	665.5 Acres	665.5 Acres

In order to inform the landowners and producers about the project and the type of practices that were available for implementation, quarterly newsletters were mailed. Several field days, workshops and meetings were conducted to educate the general public about BMPs.

The technicians also assisted with the annual Wild Wood Wanderings Environmental Camps for high school students. The main purpose of the camp is to allow high school students to experience first-hand the dynamics of a forested wetland ecosystem within a watershed that is predominantly agricultural. They learn about endangered species, water quality, nonpoint source pollution, wetland protection and wildlife habitat.



Figure 4: NPS Unit Staff Teaching Students About

During 2005, the NPS Program implemented these projects within the Ouachita River Basin:

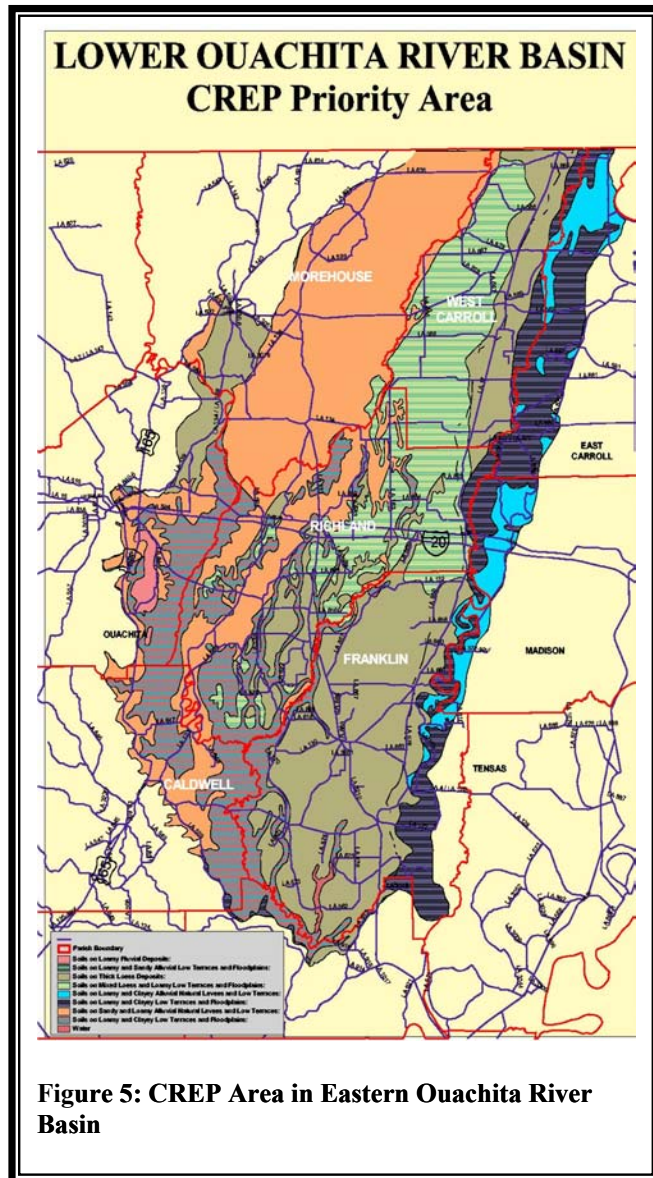
- Boeuf River/Bayou Lafourche Watershed Protection (2 projects)
- Reduction of Nutrients and Pesticides in Golf Course Runoff from entering Bennetts Bayou
- Evaluation of Effectiveness of Forestry BMPs for Water Quality Improvement in Two Sub-segments of the Ouachita River Basin
- Monitoring the Effectiveness of Forestry BMPs in the Flat Creek Watershed

During 2006, federal funding from the FY 2005 Section 319 project will result in two new projects, one in the Bayou Chauvin watershed and one to complete the watershed protection efforts in Bennett's Bayou.

Program Coordination

LDEQ works with USDA and the Louisiana Department of Agriculture and Forestry (LDAF) on the Farm Bill Programs which have resulted in increased implementation of BMPs on agricultural land. During 2005, the Environmental Quality Incentive Program (EQIP) resulted in more than 30,000 acres of practices being implemented within the Ouachita River Basin. On April 22, 2005, Earth Day, the conservation agreement for Conservation Reserve Enhancement Program (CREP) was signed by USDA's Farm Service Agency Administrator, James R. Little and Bob Odom, Commissioner of Agriculture. The CREP targets 50,000 acres within the Bayou Macon and the Boeuf River Watersheds where landowners within a 9-parish area can offer cropland and marginal pastureland for the program. The sign-up for acreage began on May 9, 2005 and will continue through December 31, 2007. Land enrollment will remain in the program for 14-15 years. The CREP agreement is a partnership among:

- USDA Farm Services Agency
- Natural Resource Conservation Service
- Louisiana Department of Agriculture and Forestry
- Louisiana Department of Wildlife and Fisheries
- Louisiana Soil and Water Conservation Districts
- Ducks Unlimited
- Black Bear Conservation Committee
- United States Business Council for Sustainable Development
- Louisiana Department of Environmental Quality



Since the agreement was signed, 24,640 acres of land have been enrolled in the program through 325 contracts with the landowners. The types of practices include:

1. Establishment of permanent native grasses
2. Tree Planting
3. Hardwood Tree Planting
4. Permanent Wildlife Habitat
5. Grass Waterways
6. Shallow Water Areas for Wildlife

7. Filter Strips
8. Riparian Buffers
9. Wetland Restoration
10. Bottomland Hardwood Restoration

The largest number of acres enrolled in the program has been for permanent wildlife habitat and bottomland hardwood restoration.

During 2005, USDA implemented 34,316.40 acres of BMPs through the Environmental Quality Incentive Program (EQIP) in the Ouachita River Basin. An additional 196.5 acres were enrolled in the Wildlife Habitat Incentive Program (WHIP).

Water Quality Improvement

Water data from the Ouachita River Basin has indicated slight improvements in water quality for *Castor Creek*, *Tensas River*, *Little River* and *Dugdemona River*. The dissolved oxygen concentration for Castor Creek has improved in 2005 when compared to the data from 1999. During 2005, the average concentration of dissolved oxygen was 7.31 mg/L and never dropped below 5.0 mg/L. In 1999, the average concentration was 6.13 mg/L and the minimum values were 4.15 mg/L in July. Castor Creek runs through a watershed that is primarily forested, with the watershed plan indicating that implementation of forestry BMPs and maintaining the riparian buffer are essential if the total nonpoint loading is to be reduced by 75% as required in the TMDL.



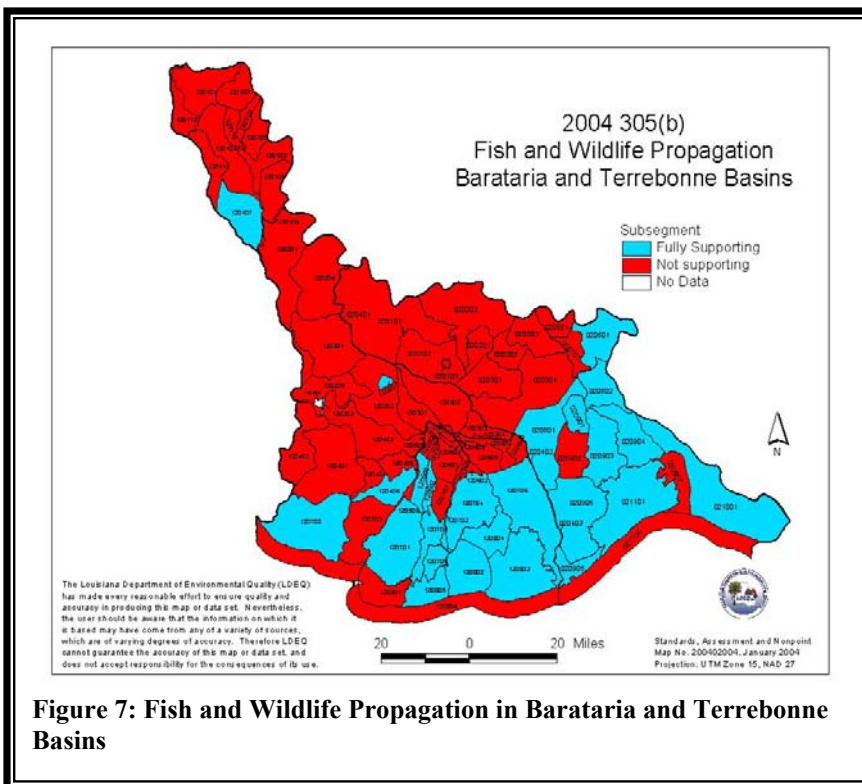
Figure 6: Agricultural Drainage in the Ouachita River Basin

The water quality within the Tensas River improved slightly in 2005, when compared to data from 2004. The average dissolved oxygen concentration was 5.71 mg/L in 2005 compared to 5.36 in 2004. The water quality values for turbidity and total suspended solids (TSS) were slightly lower in 2005 when compared to 2004.

Other water bodies in the Ouachita River Basin indicated similar trends with slight improvements in dissolved oxygen concentrations for 2005 when compared to data from 1999. The annual average concentration for dissolved oxygen in the Ouachita River was 7.04 mg/L in 2005 compared to 5.97 in 2004. The Little River had an annual average dissolved oxygen concentration of 8.2 mg/L in 2005 compared to 7.56 in 1999. The Dugdemona River remained constant at the Carter Crossing site with the average annual dissolved oxygen concentration of 6.1 and 6.3 for 1999 and 2005, respectively. The site at Beulah Road had a higher concentration of dissolved oxygen with an annual average of 7.32 mg/L.

Barataria Basin

The Barataria Basin lies within southeastern Louisiana and is bordered by the Mississippi River on the east and the Atchafalaya River on the west. The land-use within the basin is primarily agriculture, mostly sugarcane along the ridges, with forested wetlands and marshes occupying the lower elevations.



The upper portions of these two basins illustrate how difficult it is for the dissolved oxygen standard to be met within both the agriculture and forested watersheds. The agricultural lands drain to the low lying areas, delivering sediments, nutrients, and organic material to the bayous. The bayous have been channelized for agricultural drainage, oil and gas production, and navigation. The slope of the water body is so slight that the

flows are very low or non-existent during the summer months, making it difficult for the water bodies to re-oxygenate themselves. Approximately 10 TMDLs have been developed for the Barataria Basin, and TMDL development for the Terrebonne Basin is scheduled for the coming years. EPA and LDEQ are working on a Use Attainability Analysis (UAA) for the Terrebonne Basin to determine what the appropriate water quality criteria should be for dissolved oxygen. This may affect the number of TMDLs that are required to be developed.

Watershed Plans

During 2005, the NPS Unit finalized the watershed plans for the Barataria Basin for 6 water bodies, including:

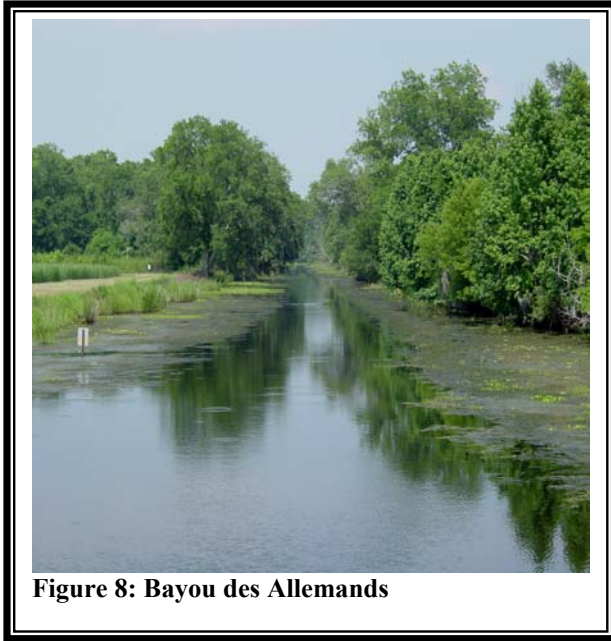


Figure 8: Bayou des Allemands

- Bayou Verret and Bayou Chevreuil (20101)
- Bayou Boeuf, Halpin (020102)
- Bayou des Allemands (020301)
- St. Charles Canals (020501)
- Bayou Segnette (020701)
- Bayou LaFourche (020401)

The watershed plans indicated that most of the land-use in these watersheds is marsh and forested wetlands with smaller percentages of land in agriculture and urban areas. The TMDLs indicated that nonpoint source loads and natural background loads would both need to be reduced by more than 50% in order to meet the water quality standards for dissolved oxygen. LDEQ will be working with the

Barataria-Terrebonne National Estuary Program on the implementation strategies for the Barataria and Terrebonne Basins. During 2005, the BTNEP continued to work on a wide range of activities, including the Pointe Aux Chien Stormwater Redirection Project.

The objective of the Pointe Aux Chien Stormwater Redirection Project is to collect baseline and post-pumping data from a pumping station in Terrebonne Parish, La. Sediment accretion, vegetative growth, fecal coliform bacteria, and water quality are data that are being monitored at the location of the new pumping station in the Pointe Aux Chenes Wildlife Management Area.

This project exemplifies the concept of rerouting water from pumping stations through wetlands found in the CCMP Action Plan EM-12 Storm Water Management. Rerouting stormwater should promote increased vegetative growth from nutrients in the stormwater, trap pollutants, and lead to fecal coliform die-off. Because of the filtration effect of wetlands, oyster and shellfish beds should be protected and enhanced from cleaner water.

Originally the Pointe Aux Chenes Project (PAC) was the EPA's Gulf of Mexico Program Shellfish Challenge Project number BT-35, "Reroute stormwater runoff from Larose to Golden Meadow to suitable wetlands." It was selected as one of the four final Shellfish Challenge projects. Instead of the original Golden Meadow pumping station, a site in the PAC Wildlife Management Area (WMA) was chosen for implementation of the project. BTNEP was instrumental to the implementation of this project not only as a funding partner, but also as a facilitator between the many agencies involved in this project, such as EPA's Gulf of Mexico Program, EPA's Gulf of Mexico Program' Shellfish Challenge Program, and Terrebonne Parish. The PAC site was chosen over the Golden Meadow site because the PAC site was an area of imperiled marsh, and had suitable hydrology for the project.

The baseline-sampling phase has been completed and the post-pumping sampling phase will begin soon. The completion date for construction of the pumping station is scheduled for early 2006. The intent of this data collection initiative was to determine if rerouting of stormwater is an effective means of marsh nourishment and stormwater filtration.

The stormwater rerouting concept has already been accepted by Terrebonne Parish, which pumps directly to wetlands outside of their flood protection levee system.

Project Implementation

During 2005, LDEQ continued to work with LSU on a watershed project for Bayou Chevreuil to quantify the loading rates from sugarcane fields and from a forested wetland to more accurately determine the level of sediment, nutrients and organic material moving off of these sites. Runoff from two sugarcane fields is being compared to a swamp forest site, a canal receiving runoff, and a water body further downstream from the receiving canal, where it is believed some assimilation will have occurred.

Water sampling equipment has been installed at two locations adjacent to private sugarcane fields where runoff is received. Rainfall and flow are continuously monitored. Three additional sites have been established for grab sample collection. The three sites for grab samples are Bayou Chevreuil near the LA 20 bridge (site downstream from fields and representing assimilation of sugarcane runoff into water body), St. James Canal (receives runoff from sugarcane fields), and swamp drainage site east of Baker Canal (somewhat pristine swamp forest). Grab samples from these three sites will be used for comparison with samples taken from the two instrumented sites.

TKN, NO_3^- and NO_2^- , Ammonia, Total P, $\text{PO}_4^{3-}\text{-P}$, TSS, and pesticides [the major spectrum of Atrazine, Metribuzin (Sencor), Pendimethalin (Prowl), Terbacil, Trifluralin (Treflan), Esfenvalerate (Asana), Cyfluthrin (Baythroid), and Lambda-cyhalothrin (Karate)] are being analyzed.

Sampling began in 2005. In total in 2005, six run off events were sampled: March 17, May 1, May 31, July 17, August 31 (following Hurricane Katrina), and September 25 (following Hurricane Rita). Samples were collected when rainfall was sufficient to have run-off at both sugarcane sampling locations. For each sampling activity, there was sufficient run-off to see flow in the St. James Canal through Bayou Chevreuil. Most of the times, water was of high turbidity, indicating some impact of sugarcane runoff to lower reaches of the water body.

Preliminary analysis indicates that phosphorus contents show a good correlation with total suspended solids. Atrazine has been the dominant pesticide in the sugarcane runoff. The Swamp forest site has shown a background that has not been impacted by the sugarcane runoff. Runoff from the two sugarcane sites has shown potential impacts to canals and streams.

During 2005, LDEQ continued to implement NPS projects within the Barataria Basin, including:

- Upper Barataria Basin Watershed Project in the Bayou Chevreuil
- St. James Parish NPS Educational Camps
- Watershed Implementation in Bayou Segnette
- Urban BMP Training and Education for Construction Runoff and Home Sewage Education Awareness

During 2006, LDEQ will begin working with LSU on a project within the Barataria Basin to link the Coastal Restoration Program with the NPS Program to gain a better understanding of how water quality will be affected by the introduction of fresh waters from diversions into bayous and lakes within coastal areas.

Water Quality Improvements

Water quality data from 2005 in Bayou Lafourche indicated that the annual average dissolved oxygen concentration was meeting the water quality standard for dissolved oxygen. The turbidity values had dropped substantially since 2004 with a decrease from 38 to 26.27 NTU. Total organic carbon has remained relatively constant since 2004, but it is higher than it has been in previous years. Water quality in Bayou Boeuf has also improved with the average annual dissolved oxygen concentration exceeding the state's water quality standard of 5 mg/L. The average turbidity dropped from 31.5 to 23.2 NTU, but the total organic carbon was higher in 2005 than in 2004.

During 2005, USDA continued to implement programs through the Farm Bill, which resulted in 17,112 acres of BMPs implemented through EQIP. There were 168.2 acres of BMPs implemented through the WHIP. There were 456.9 acres implemented through the Grassland Reserve Program.

Mermentau River Basin

The Mermentau Basin lies in southwestern Louisiana and was one of the initial basins targeted for development of TMDLs. The watershed plans were written in 2002. During 2005, LDEQ has continued to work with other state and federal agencies and local universities on implementing activities within these priority watersheds.

During 2005, LDEQ implemented projects within the Mermentau River Basin, including:

- Bayou Plaquemine Brule Watershed Monitoring Project
- Soybean BMP Demonstration Project
- Reducing the Impact of Crawfish Aquaculture through Implementation of BMPs
- Reducing NPS Pollution in Bayou Wickoff Sub-Watershed
- Reducing NPS Pollution in Cole Gully Sub-Watershed
- Adaptation of the AnnAGNPS Watershed Model to Include Rice and Crawfish Components

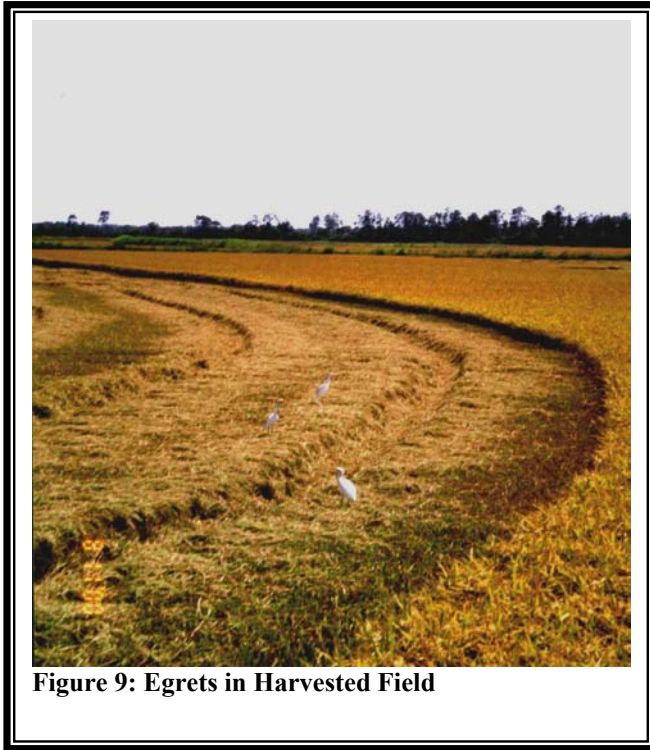


Figure 9: Egrets in Harvested Field

Highlights of the work from the Bayou Plaquemine Brule have been provided in the 2003 and 2004 NPS Annual Reports and can be found on LDEQ's NPS website in 2006. The water quality data from 2005 indicated that water quality problems persist in the Mermentau River with the average annual concentration of dissolved oxygen being 3.38 mg/L, which is comparable to the range of values from 2001. Both of these years were drought years, but total suspended solids and turbidity values were higher during 2005 than in previous years, especially during April and May. The spring values for sediment and organics continue to be high, indicating that rice field discharges are causing the problems in this basin. The watershed models indicate that rice field BMPs will bring the reductions in nonpoint source pollutants that are necessary to meet water quality standards, but it will take time and commitment on the part of the farmers in this basin to utilize these practices.

The Vermilion Soil and Water Conservation District (SWCD) is developing a Planned Intervention Micro-Watershed Approach (PIMA) Demonstration Project. This Project is bringing together all the stakeholders (landowners, farmers, and state and federal agencies) in a small watershed within Vermilion Parish to demonstrate how producers (landowners) can work with conservation programs and BMPs to improve water quality. In this watershed, at least 75% or more of producers will have the opportunity to participate in various conservation programs unique to their farming operations. This represents a concentrated effort in a micro-watershed where performance and results can be measured versus one where conservation efforts are scattered throughout the district and water quality cannot be measured. This program is voluntary and producers choose to participate.

The name of the micro-watershed is Coulee Baton and is located in Vermilion parish in the town of Kaplan, LA off of Hwy 14, Coulee Baton Bridge. Coulee Baton is in the Mermentau River Basin, subsegment 050702. The agencies involved are the Vermilion Soil and Water Conservation District (SWCD), Louisiana Department of Environmental Quality (LDEQ) Nonpoint Source Program, Louisiana Department of Agriculture and Forestry (LDAF), Louisiana State University Agricultural Center (LSU AgCenter), University of Louisiana at Lafayette (ULL) Department of Renewable Resources, Tarleton State University Texas Institute for Applied Environmental Research (TIAER), Natural Resources Conservation Service (NRCS), and the United States Department of Agriculture (USDA).

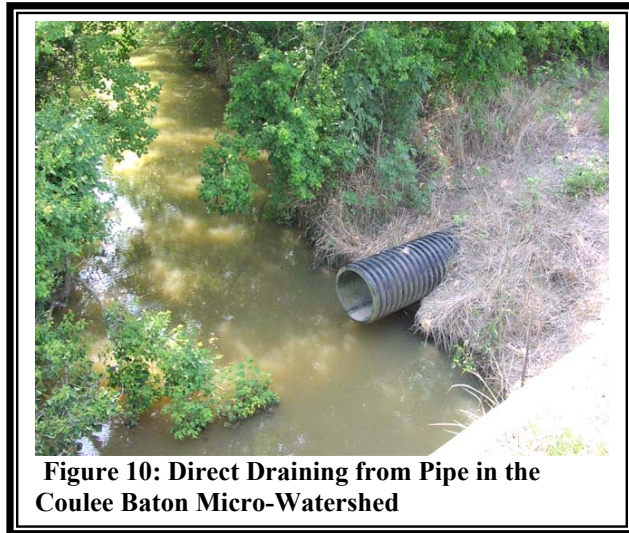


Figure 10: Direct Draining from Pipe in the Coulee Baton Micro-Watershed

During 2006, LDEQ will continue to work on watershed implementation projects for the Bayou Plaquemine Brule, Bayou Wickoff and Cole Gully and will have a new project to examine the statistical relationships of changing water quality and land-use patterns within the Mermentau Basin over time.

During 2005, USDA implemented approximately 15,970 acres of BMPs within the Mermentau River Basin through the Environmental Quality Incentive Program (EQIP). An additional 70 acres of practices were implemented through the WHIP and 170 acres through the Grassland Reserve Program (GRP).

Vermilion River Basin

The Vermilion River Basin also lies within southwestern Louisiana and had TMDLs and watershed plans completed during 2002 and 2003. TMDLs were developed for *Bayou Teche, Bayou Boeuf, Vermilion River, Bayou Cocodrie, Bayou Courtableau and Lake Fausse Point and Dauterive Lake*. Watershed plans were also developed for the *Vermilion River, Bayou Teche, and Bayou Cocodrie (including Cocodrie Lake, Bayou Cocodrie and Chicot Lake)* during 2002.

During 2005, LDEQ has continued to work with state and federal agencies, local universities and the Bayou Vermilion District on projects to improve water quality in the Vermilion River. These projects included:

- Vermilion-Teche Water Quality Monitoring Project
- Vermilion-Teche Watershed Restoration Project
- Lower Vermilion River Watershed NPS Project
- Sugarcane BMP Effectiveness Project
- City of Lafayette “Better Buffers” Project

Highlights from these projects have been provided in the 2003 and 2004 NPS Annual Report and will also be available on LDEQ’s NPS and the Bayou Vermilion District’s websites.

The water quality data from 2005 indicated that the water quality in the Vermilion River has not improved during 2005. The average annual dissolved oxygen concentration of 3.35 mg/L for 2005 was lower than the annual average of 4.1 mg/L for 2004. There was a very low dissolved oxygen reading in June on the Vermilion River which affected the annual average for 2005. Since 2005 was a very dry year, this may be one of the reasons for the lower oxygen readings, but the average annual concentration of turbidity and organic carbon were also higher during April and May, 2005 than in any previous years since 1998. So it may be a result of increased pollutant loading.

During 2005, USDA implemented approximately 11,654 acres of BMPs within the Vermilion-Teche River Basin. An additional 116 acres enrolled in the WHIP and 76 in the Grassland Reserve Program.



Figure 11: Lake Martin

Calcasieu River Basin

The Calcasieu River Basin lies within southwestern Louisiana and was prioritized for TMDL development in 2002 and for watershed plans in 2004. TMDLs were developed for 16 water bodies within the Calcasieu River Basin and watershed plans were developed for 6 watersheds, including: *Mill Creek, Barnes Creek, Marsh Bayou, Bayou Serpent, Little River and Indian Bayou*. During 2005, LDEQ has worked with the Allen Parish Soil and Water Conservation District on a watershed project in Bayou Serpent to reduce the nonpoint source pollutant loads from agricultural lands.



Figure 12: Bayou Serpent

Project Implementation

The Allen Soil and Water Conservation District is providing financial and technical assistance to landowners in the Kinder area of Allen Parish who adopt specific conservation practices and agree to have their lands available as demonstration sites.

The project began August 1, 2002. About ten landowners signed on to participate and 4255 acres are involved, mostly rice farms. Three-year agreements are presently in progress. Some delays have occurred from Hurricane Rita on September 24, although the project is still on schedule.

The project has produced significant results establishing solid conservation efforts on the ground. In particular, winter wildlife habitat has been significantly improved for migratory waterfowl and neo-tropical birds. Soil erosion savings, from conservation practice implementation, has been calculated to exceed 5,000 tons of soil saved. Producers are reducing the amount of sediments and nutrients in the surface waters and improving the overall health and productivity of the natural resources on their operations.

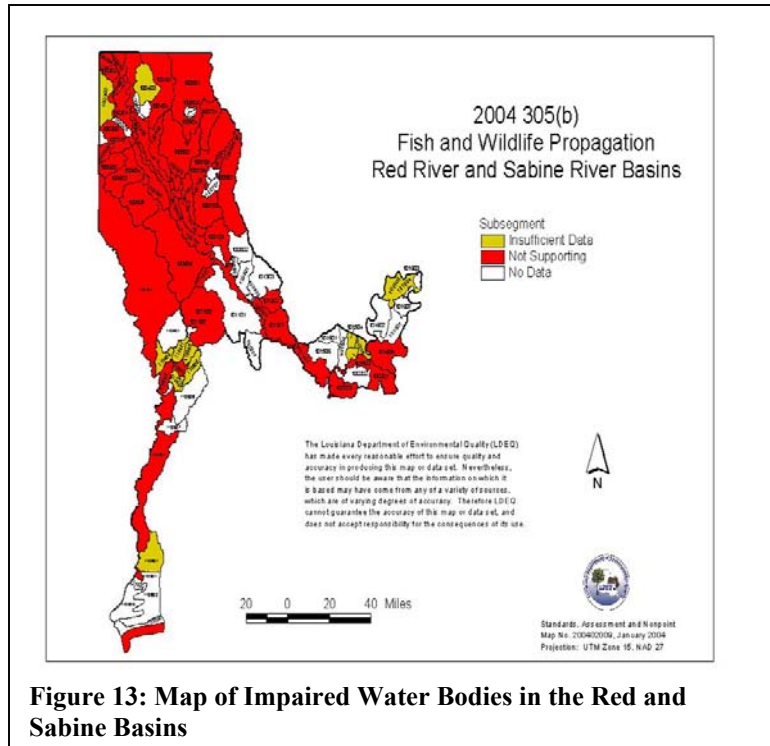
Water Quality Improvement

Water quality data from 2005 for the Bayou Serpent indicated that dissolved oxygen concentrations had declined since 1999, with average annual values of 2.78 and 3.80 respectively. There were similar trends for Barnes Creek and Marsh Bayou, with an average annual concentration of 3.35 mg/L in 2005 compared to 4.36 mg/L in 1999 for Barnes Creek and 1.81 mg/L for Marsh Bayou in 2005 compared to 2.76 in 1999. The level of total organic carbon (TOC) increased in Bayou Serpent during 2005 when compared to 1999, but it remained relatively constant in Barnes Creek and it declined substantially in Marsh Bayou. Turbidity increased substantially in Bayou Serpent from 1999 to 2005, with one very high value in April. Turbidity declined in Barnes Creek and Marsh Bayou in 2005 compared to the 1999 values.

During 2005, USDA implemented 9,414 acres of BMPs were implemented in the Calcasieu Basin. An additional 88.9 acres of practices were implemented through the WHIP.

Red and Sabine Basins

The Red and Sabine Basins are located in the north and western portions of the State and are primarily utilized for forests and pastures. Both the Sabine and the Red River Basin had a substantial number of water bodies not fully meeting their uses. During 2005, the Water Quality Survey Team conducted sampling for a use attainability analysis for East Anacoco Creek and completed intensive surveys for development of TMDLs on 4 water bodies and initiated work on 23 more. The ambient network collected data on 29 water bodies. The water quality data for a few of these water bodies indicated that the Red



River maintains the water quality standard for dissolved oxygen even though the concentration of total organic carbon and turbidity is higher than in previous years. Water quality in Paw Paw Bayou indicated a slight increase in the concentration of dissolved oxygen from 2002 to 2005 and a slight decrease in total organic carbon, but the turbidity level was higher. Water quality in Cross Lake also remained relatively stable with slight declines in the annual average concentration of D.O. and turbidity but slightly higher values of total organic carbon.

All of the TMDLs for the impaired water bodies will be completed by March 2007-2008 and watershed plans will be developed for those watersheds that have impaired waters. During 2005, LDEQ continued to work on several projects in the Red and Sabine Basins including:

- Water Quality and Crop Production Response to the Use of BMPs and Poultry Litter
- Application of Poultry Litter to Forested Areas
- Wallace Lake Watershed Restoration Project
- Cross Lake Watershed Project
- De Soto Dairy Clean-Out Program
- Constructed Wetland to Improve Whole Farm Operations

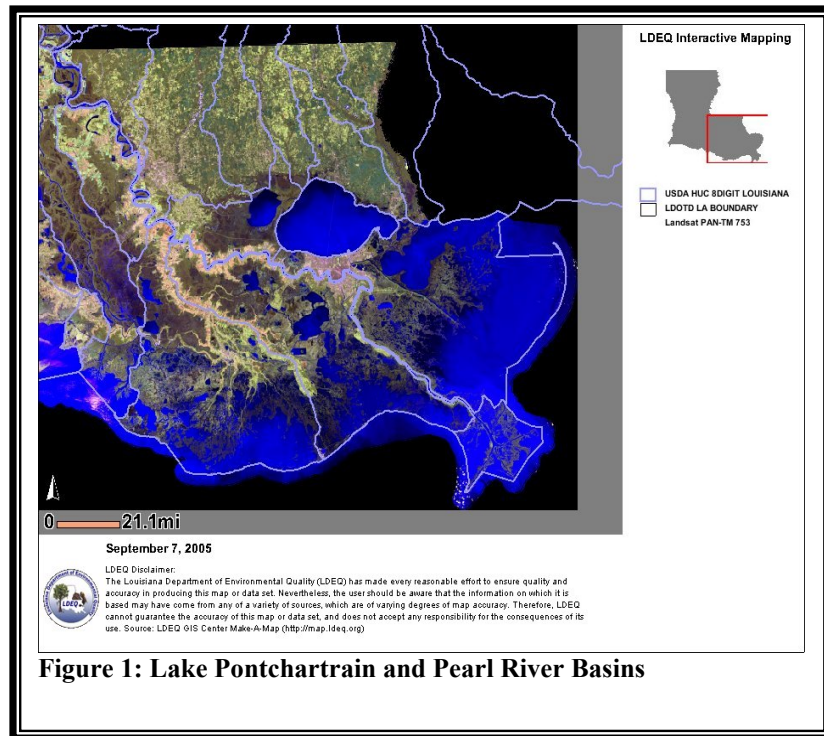
During 2006, LDEQ will continue to work on some of these projects and will begin to work on watershed plans for the impaired water bodies in this part of the state after the TMDLs have been completed in 2007.

During 2005, there were approximately 23,107 acres of BMPs implemented within the Red and Sabine River Basin through the Environmental Quality Incentive Program (EQIP). There were an additional 202.8 acres of BMPs implemented through the WHIP and 52.7 acres through the Grassland Reserve Program.

Lake Pontchartrain and Pearl River Basins

During 2005, ambient data was collected for 11 water bodies in the Lake Pontchartrain and Pearl River Basins and additional data was collected to determine the impacts of Hurricane Katrina. Hurricane impacts from Katrina affected the water quality of water bodies on the north shore and south of New Orleans, but impacts to Lake Pontchartrain appear to be short-term. A multi-agency team of scientists have been and continue to collect water quality data in these impacted areas to

determine whether water quality or aquatic biota have been affected by the storms. More details on the impacts from the hurricanes have been provided in Appendix A.



During 2005, LDEQ worked with local entities to implement projects within the Lake Pontchartrain and Pearl River Basins, including:

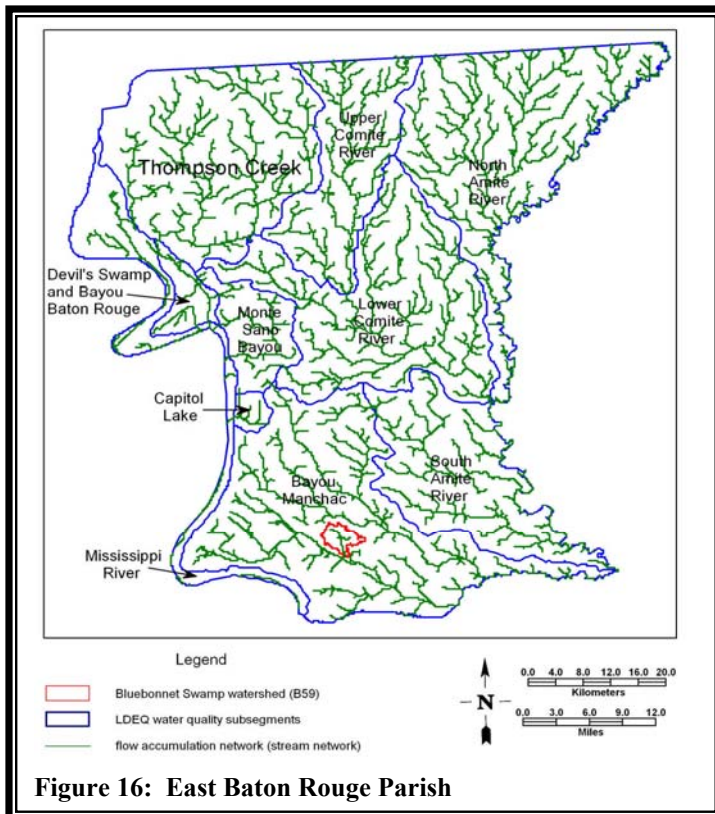
- Watershed Education for Bayou DuPlantier
- Modeling and Monitoring in the Lake Pontchartrain Basin
- Development of Site Conservation Plan & Addressing NPS Pollution in the Pearl River
- Mitigating NPS Pollution in Urban Watersheds With Spatial Modeling, BMP and Community Outreach
- Reduction of Urban NPS Pollution in the Lake Pontchartrain Basin
- Florida Parishes Water Quality and Grazing Land Management Demonstration Project
- Mandeville Neighborhoods Urban NPS Project

Project Implementation

Mitigating Nonpoint Source Pollution in Urban Watersheds

Baton Rouge, which is in the Lake Pontchartrain Basin, is the fastest growing area in Louisiana. As East Baton Rouge Parish continues to develop, many of the vegetated areas are replaced with impervious land uses. As a result, local hydrologic conditions are altered resulting in water quality degradation and flooding problems in areas that previously experienced little or no impact.

The specific goal of the *Mitigating Nonpoint Source Pollution in Urban Watersheds with Spatial Modeling, Best Management Practices for Wetlands, and Community Outreach* project is to provide information on the contribution of urban runoff to nonpoint source pollution, identify and



implement strategies, and examine the effectiveness of various BMPs in East Baton Rouge Parish (EBRP).

The Bluebonnet Swamp is an urban park which serves as the main hydrologic receiving area for a 1,000-acre watershed in south Baton Rouge that has undergone a rapid sequence of residential and commercial development over the past decade. An important purpose of this project is to connect actions taken by developers and parish officials with regional or sub-basin effects. During the past year, documentation of the footprint of that development, including BMPs implemented, has been determined so that the effects on hydrology can be hind cast using a calibrated runoff model.

For the extent of the project thus far, the Wetland Steering

Committee was established by EBRP during Year One and met quarterly during Year Two. The mission of the Wetlands Steering Committee is “to support the efforts of the EBRP Wetlands Program by promoting community understanding and awareness, and facilitating resources to mitigate nonpoint source pollution for the purpose of improving wetlands conditions and functionality in EBRP.” This committee is made up of 10 official members, including representatives of city-parish, state and federal resource agencies, nongovernmental organizations and the developer/builder community.

Mandeville Neighborhoods

Another city that has experienced growth in recent years is Mandeville, which is located on the north shores of Lake Pontchartrain. As Mandeville has grown, residential development has increased, which has resulted in a decline in the quality of the natural environment and an increase in environmental pollution. This is presenting a challenge for residents who were originally drawn to Mandeville because of the extensive green spaces and the unpolluted environment.

Stormwater runoff from residential lawns, streets, and parking lots is known to contain pollutants that can degrade the water quality in local receiving streams. Urban areas have greater amounts of impervious surfaces, which reduce the amount of infiltration and percolation of stormwater.

The Mandeville Neighborwoods project will demonstrate how green space (i.e. an undeveloped parcel of land) can be used to manage urban stormwater runoff and to also serve as a neighborhood recreational area. The project site will also demonstrate several different types of wetland theme gardens, which will emphasize a naturalized approach for mitigating stormwater that is cost effective and complimentary to the landscape. Once complete, the Mandeville Neighborwoods site will provide local residents opportunities for passive recreation, nature watching opportunities, and environmental education.

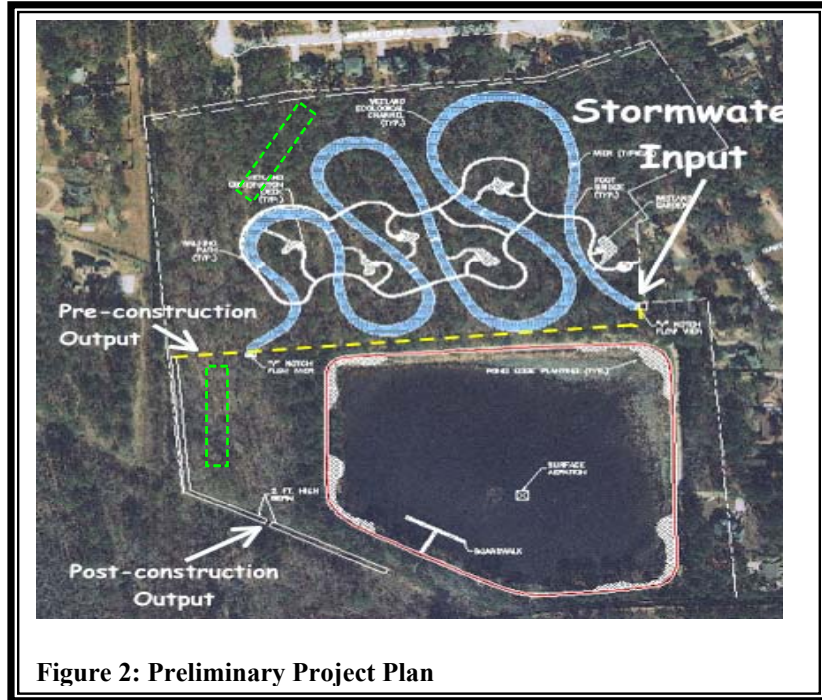


Figure 2: Preliminary Project Plan

The project site is located within the State's Watershed Subsegment 040803. The area encompasses the Lower Tchefuncte River from La. Hwy 22 to Lake Pontchartrain. It is described as an estuarine environment. The project site drains into an unnamed drainage ditch, which drains into Bayou Chinchuba and into the Tchefuncte River near its mouth and then into Lake Pontchartrain.

The project goal is to increase environmental education and outreach regarding urban Nonpoint Source stormwater pollution in an effort to increase environmental awareness and implementation of stormwater management practices. The project objectives are to:

- Demonstrate management practices for controlling urban NPS pollution;
- Monitor the effectiveness of the stormwater controls;
- Serve as a neighborhood recreational area for walking, jogging, and public environmental education and outreach opportunities.

The project area is composed of 22 acres of green space and has been purchased by the City of Mandeville. Water and vegetation sampling analysis will be performed before and after site construction. Site construction will involve the creation meandering wetland ecological channels, bio-retention ponds with native Louisiana wetland plants, a boardwalk, and educational kiosks. A master plan of the site is in the final development phase. Once the Quality Assurance Project Plan (QAPP) plan is approved by the Environmental Protection Agency (EPA), sampling and construction will begin.

Site Conservation Plan

To address conservation issues along the lower Pearl River, the Lower Pearl Partnership was formed in 2002 by the Nature Conservancy's Mississippi and Louisiana Chapters with the Mississippi and Louisiana Departments of Environmental Quality.

TNC has worked with a variety of stakeholders, including many agencies and landowners, to restore, preserve and protect the ecological integrity of the Pearl River and its watershed.

TNC organized and facilitated a series of conservation planning workshops with experts from both states and completed a Conservation Area Plan for the Pearl River. The Pearl River Plan includes results from the planning workshops and identifies the focal conservation target species or natural communities of greatest concern, stresses and sources of stress to the river.

Much of the focus has been on sand and gravel operations, which have been identified as a serious threat to water quality in the Pearl. The contractor continues to meet with staff from Louisiana state agencies that oversee sand and gravel mining. TNC discusses the agency's role with sand and gravel regulations in Louisiana and plans to prepare a report summarizing findings.

Water Quality Improvements

Water quality data was collected for water bodies within the Lake Pontchartrain and the Pearl River Basins during 2005. The water quality data for the Tchefuncte River indicated that the dissolved oxygen is relatively good with only a few months falling below the water quality standard. The annual average was 5.46 mg/L with the lowest values being during the summer months. The turbidity has remained fairly constant since 2002 with a range from 9.1 to 10.9 NTU. The concentration of total organic carbon (TOC) has also remained fairly constant for 2004-2005 with values of 10.62 to 11.12. The concentration of dissolved oxygen for the Bogue Chitto River is good, with an average annual concentration of 8.0 mg/L and no values dropping below 5 ppm. The values for turbidity and total organic carbon (TOC) have declined slightly from 2004. The water quality in the West Pearl River has remained good with the average annual concentration of 6.67 mg/L and no values dropping below the water quality standard of 5.0 mg/L. The range of values for total organic carbon (TOC) has remained relatively constant since 2004 with values of 7.15 to 7.41 mg/L.



Figure 3: Tickfaw State Park

During 2005, there were approximately 18,224 acres of BMPs implemented through the EQIP in the Lake Pontchartrain and Pearl River Basins. There were an additional 374.5 acres of practices implemented through the WHIP and 647.3 acres of practices implemented through the Grassland Reserve Program.

Statewide Implementation

In addition to nonpoint source projects that have been targeted at the watershed level, there have also been programs implemented during 2005 to address nonpoint source concerns on a statewide scale. This allows progress to be made across the state rather than only in targeted watersheds. The NPS Management Plan also included tasks and milestones for implementation of statewide programs for *agriculture, forestry, urban, home sewage, hydromodification, construction* and *resource extraction*. During 2005, LDEQ has worked with many entities to make progress in implementing the statewide NPS Programs.

Progress in Statewide Agricultural Programs

During 2005, there has continued to be extensive efforts made in implementing agricultural BMPs. This progress is accomplished through the funds provided from the U.S. Farm Bill and also through the work done by the LSU AgCenter on the Master Farmer Program. Through the Farm Bill, approximately 148,190 acres of BMPs were implemented with funds from EQIP for livestock operations, cropland and forestlands. Through the EQIP, 1274 contracts have been entered into with landowners for 148,190 acres of BMPs and a contract obligation of \$14,529,000. St. Landry parish had the highest acres of practices implemented, treating approximately 7796 acres of land with BMPs.

In addition to the EQIP, there were 204,794 acres of lands recorded enrolled in the Wetland Reserve Program (WRP). Of this acreage, 144,797 acres have been restored to hardwood forests with the total cost of easement acquisition being \$169,105,711. The Wildlife Habitat Incentive Program (WHIP) resulted in 2036 acres of land being managed for wildlife for a cost of \$502,668. Beauregard parish had the highest number of acres enrolled in WHIP with 683 acres. The Grassland Reserve Program resulted in 1708 acres of land being enrolled in grasslands, with Pointe Coupee and Tangipahoa parishes being the two with the largest amount of acreage enrolled in the program.

Louisiana received \$2.2 million for the Conservation Security Program (CSP) which resulted in 19,176 acres of land enrolled in the program in southwestern Louisiana, primarily in the Vermilion and Mermentau Basins. Approximately \$2.2 million was allocated for this program in 2005.

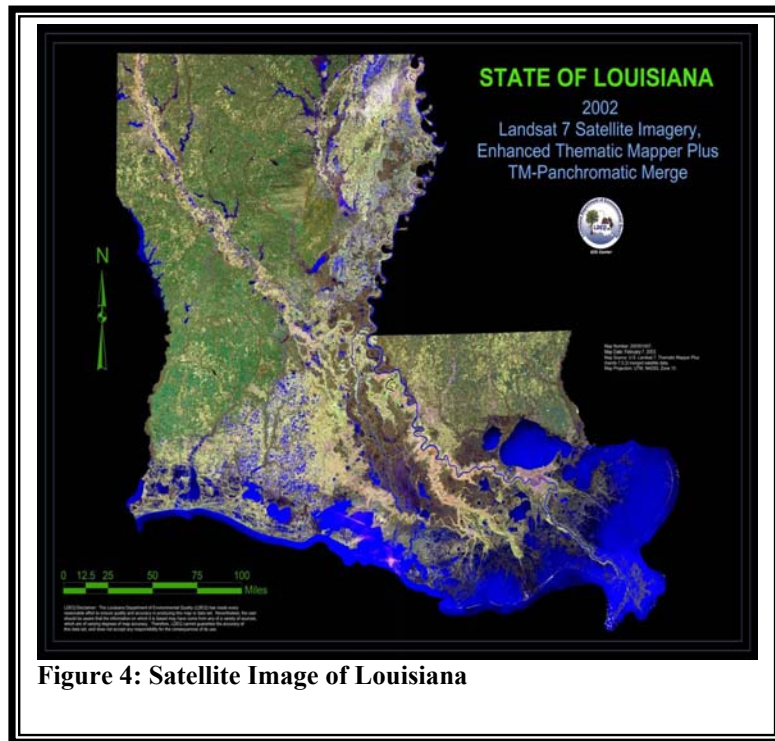


Figure 4: Satellite Image of Louisiana

Model Farms

In addition to the work that USDA has done, LDEQ has continued to work with the LSU AgCenter on the Master Farmer Program through the project on Model Farms. In 2005, 12 Master Farmer trainings were conducted in the Mermentau, Vermilion-Teche, Ouachita, Red River, Calcasieu, Pontchartrain, and Barataria-Terrebonne watersheds. Approximately 565 agricultural producers enrolled in the program during the past year. The “Model Farm” phase, Phase II, of the program, was implemented in 2005 when the selection process and equipment setup was complete. Twelve farms were selected in five watersheds (Mermentau, Ouachita, Red River, Calcasieu, and Vermilion-Teche) to represent commodities in those areas of the state. Commodities represented are cotton, soybeans, rice, crawfish, cattle, poultry, corn, wheat, and sugarcane. Sampling equipment was installed on all 12 sites and data will be collected over the next two years to show the impact of specific BMPs on these operations. These BMPs will vary by commodity, soil type, and location. Six Model Farm field days were held in 2005, specifically in the Ouachita, Vermilion-Teche, Mermentau, and Calcasieu watersheds. Approximately 321 producers attended these field days, fulfilling their requirements for Phase II of the program.

To date, more than 2023 agricultural producers are enrolled in the Master Farmer Program, representing approximately 1.8 million agricultural acres of land. Because the program is consistently promoted at field days, production meetings, and state-wide conferences, it is becoming a more widely recognized program throughout the South. An MOU was signed by Mississippi, Arkansas, and Texas to begin development of a Master Farmer program in those states. Because of additional interest, a program “How-To” guide and template was developed for use in these states and in the southern region.

The Natural Resource Conservation Service (NRCS) is a very involved partnering agency with the LSU AgCenter and the Master Farmer Program. They assist in teaching the instructional portion of Phase I and are also involved in the development and implementation of conservation plans on producers’ operations. As an incentive, NRCS stated that they, as an agency, will award producers who are applying for cost share through EQIP, an additional 2 points in their ranking system. This will assist some producers in acquiring additional funding for BMP implementation on their operations.

Progress in Statewide Forestry Programs

During 2005, the Louisiana Office of Forestry and the LSU School of Renewable Resources submitted the statewide survey on Forestry BMP Implementation. It reported that a total of 145 sites had been surveyed to determine the extent that forestry BMPs had been utilized. The survey included a field inspection combined with completion of a series of survey forms. The draft report indicated that 95% of the sites that were surveyed had an adequate level of BMP implementation to comply with the state’s forestry BMP manual. LDEQ had comments on the draft final but this high level of BMP compliance continues to indicate that extensive work has been done to educate the landowners and loggers about the types of BMPs that need to be implemented to improve water quality.



Figure 5: Cypress -Tupelo Forest

Forestry BMP Website

During 2005, work continued on the forestry website project. Louisiana's forest industry has for some time realized the necessity of encouraging environmental stewardship with respect to the maintenance of water quality in areas utilized for forest production. One way to accomplish this is continued education of the forestry community, the logging community, forestry educators themselves, and the general public. The Forestry Agencies of Louisiana are unable to keep up with the demand for information on Forestry Best Management Practices (FBMPs), which are currently available in leaflet form. One way to achieve greater efficiency is through the use of new and emerging communication technologies such as the Internet. Louisiana's Nonpoint Source Management Plan committed to a 15-year schedule for measurable water quality improvement

from statewide educational activities, so it is important that these programs reach the largest audience possible.

The overall goal of the project is to educate a diverse audience of loggers, foresters, forest industry leaders, non-industrial private forest landowners, educators, and other interested stakeholders by means of an interactive website and CD-ROM. The main focus is the environmental and economic benefits of FBMPs. The website and CD-Rom is being developed by the Louisiana Cooperative Extension Service with input from a broad working group of experts on FBMPs. The project also incorporates workshops to train different interest groups in the use of the website/CD-ROM.

The website is in its final stages of development. More FBMPs will be added to the website as well as downloaded instructional video demonstrating the proper installation of the various FBMPs.

During 2005, LDEQ participated on the Advisory Panel for Coastal Wetland Forests, which made recommendations to the Governor as to how to manage the state's cypress-tupelo forests to minimize the impact to coastal waters and wetlands. The Science Working Group provided their recommendations in June 2005, which emphasized the need to manage these forests by Condition Classes. The final report from the Science Working Group can be found at <http://www.coastalforestswg.lsu.edu/>. The final report from the Advisory Panel is scheduled to be submitted to the Governor's Office early in 2006.

Progress in Urban Programs

During 2005, LDEQ continued to work with East Baton Rouge Parish Planning Commission, the City of Lafayette, the City of Mandeville and other communities on urban nonpoint source issues. In addition to work with individual cities, LDEQ worked with a contractor to complete a project, Model Landscape Codes for the State of Louisiana. The project website can be found at <http://www.abbey-associates.com/splash-splash>.

The purpose of this project was to provide communities within Louisiana with a reference book on design standards for better site design for landscape ordinances. As better site designs are utilized, then natural habitats can be

preserved and more emphasis can be placed on vegetative buffers for parking lots, public streets and urban streams. These concepts have been factored into site designs in other parts of the country and St. Tammany Parish, LA is in the beginning stages of incorporating the Model Code as part of a Landscape and Urban Reforestation Advisory Work Group.



Figure 20: Urban Runoff into Storm Drain

Through this process, cities that are working on compliance with Storm Water Regulations, or the smaller cities that are still defined as part of the NPS Program, can take steps to revise their codes and improve storm water management.

Progress in Sand and Gravel Mining BMPs

During 2005, LDEQ continued to work with the Concrete and Aggregate Association on a BMP manual for sand and gravel mining. A draft manual has been completed and provided to the Association for their review and comment. A final draft of the manual is expected to be available for review and comment by a larger audience and the public in 2006. The manual concentrates on the types of BMPs that need to be implemented from the initial stages of site clearing to site restoration following the mining operation. The goal of the manual is to standardize the range of practices for sand and gravel mining operations in order to limit the impacts that these operations have on water quality within the State of Louisiana.

Appendix A

Impacts from Hurricanes Katrina and Rita

Hurricane Katrina

On August 29, 2005, Hurricane Katrina struck Louisiana causing widespread damage within the Lake Pontchartrain, Pearl River, Terrebonne, and Barataria Basins. The specific effects of Hurricane Katrina were unforeseen and uncontrollable. In addition to emergency conditions, short- and long-term effects to surface water quality have been a concern, and monitoring programs were designed to determine the extent of the damage caused by Katrina.

Land uses in the impacted watersheds (Lake Pontchartrain, Pearl River, Terrebonne, and Barataria Basins) range from coastal marshes and cypress tupelo forests to highly urbanized and agricultural areas, with both natural and anthropogenic sources of pollutants. In the aftermath of Hurricane Katrina, preliminary sampling results showed high concentrations of fecal coliform bacteria, which were attributed to both point and nonpoint sources. Failing wastewater treatment plants, debris, and animal waste or carcasses contributed to the concentration of bacteria in the receding floodwaters. High organic loads from marshes and forests transported sediments, nutrients, and organic material into the receiving waters. Pesticides from row crop agriculture and highly urbanized areas, as well as oil and grease from submerged parking lots, roads, highways, and driveways were expected to be unusually high. Sediment from construction sites, nutrients from fertilized lawns, and heavy metals (zinc, cadmium, chromium, copper, and lead) were also expected to be sources of pollutants within the urbanized areas.

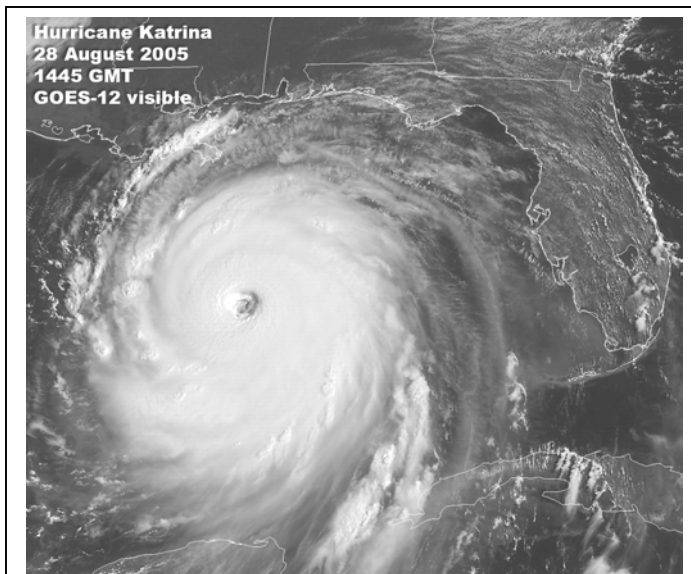


Figure 6: Hurricane Katrina

To determine the environmental impacts, LDEQ worked with its state and federal partners to establish a unified Incident Management Team (IMT) for the coordination of environmental-related emergency response, assessment, and recovery efforts. Joining DEQ in the IMT were the Texas Commission on Environmental Quality (TCEQ) "Strike Team", EPA emergency response units, representatives from the Louisiana Oil Spill Coordinators Office (LOSCO), the U.S. Coast Guard (USCG), the National Oceanographic and Atmospheric Administration (NOAA), and the United States Geological Survey (USGS).

The LDEQ Water Quality Assessment Division (WQAD), the LDEQ Surveillance Division, and the USGS monitored surface waters in the impacted areas. The initial sampling plan concentrated on Lake Pontchartrain to gauge the effects of receding floodwaters as well as the effects of pumped water diverted from the Greater New Orleans area into the lake. As accessibility and resources permitted, monitoring expanded to more areas north of Lake Pontchartrain and to areas south/southeast/east of New Orleans (e.g., St. Bernard and Plaquemines Parishes, Chalmette, etc.).

Following Hurricane Katrina, sampling was conducted at 58 sites in the impacted areas of Southeast Louisiana. As of January 26, 2006, 19 sites were still being monitored specifically to assess any

remaining hurricane impacts. With regard to water quality, the most heavily impacted water bodies were north shore tributaries of Lake Pontchartrain. This area is generally heavily forested and an immense quantity of trees and other vegetative debris was deposited in area water bodies. This initially caused a rapid decline in dissolved oxygen concentrations, sometimes nearly to 0.0 mg/L. Over time these streams have recovered to where most are at or near their criteria. There were limited metals criteria exceedances for lead, chromium and mercury in some of these streams; the exceedances are under investigation. Complete recovery of water quality in this area is expected to take several more weeks as the vegetation and other debris is gradually removed from these streams. LDEQ has begun limited ambient monitoring in the area; results from this sampling will be carefully reviewed to determine if hurricane impacts remain or if conditions have returned to normal.

With regard to Lake Pontchartrain, there were virtually no impacts to the lake caused by the hurricane or the pumping of floodwaters from the New Orleans area. Dissolved oxygen, fecal coliforms, metals, organic compounds, and other parameters all remained at or below water quality criteria. Fish tissue testing conducted by EPA, NOAA, and LDEQ indicated that there was no contamination of fish resulting from the pumping of floodwaters.

Hurricane Rita

Hurricane Rita struck Louisiana's coast on September 24th as a Category 3 storm and devastated the western parishes of the state. Cameron, Creole, Grand Chenier, and Holly Beach were devastated. Lake Charles experienced severe flooding with water rising from 6-8 feet. Water quality in the bayous of Calcasieu, Vermilion-Teche, and the Mermentau River Basins were impacted by heavy loads of organic material, sediments and salt water that remained in the system for months. The water quality data from late October and early November continued to show low values of dissolved oxygen for water bodies in the Mermentau, Vermilion and Calcasieu River Basins. Therefore, these two events have affected the ability of LDEQ to report as much success as expected in some of the water bodies where the NPS Program has been focusing much of its efforts.

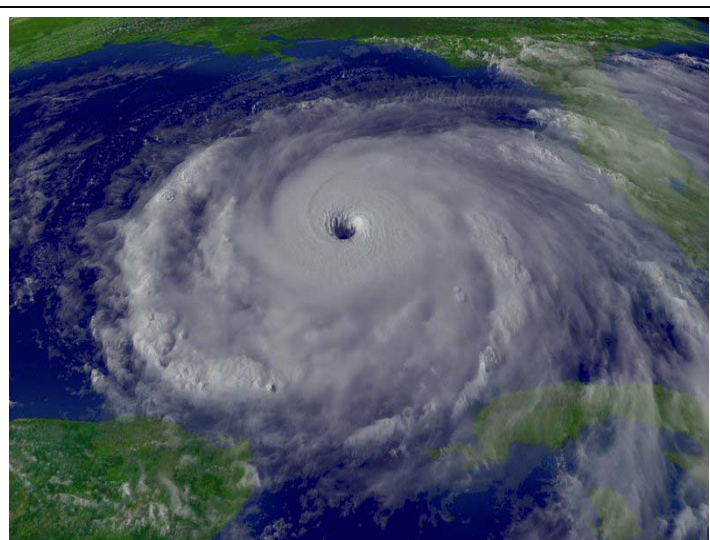


Figure 7: Hurricane Rita

Following Hurricane Rita, sampling was conducted at 51 sites in the impacted areas of southwest and south-central Louisiana. Monitoring results in the Rita impact area are being evaluated to determine the need for further investigation and monitoring. LDEQ has begun limited ambient monitoring in the area; results from this sampling will be carefully reviewed to determine if hurricane impacts remain or if conditions have returned to normal.

Following Hurricane Rita, sampling was conducted at 51 sites in the impacted areas of southwest and south-central Louisiana. Monitoring results in the Rita impact area are being evaluated to determine the need for further investigation and monitoring. LDEQ has begun limited ambient monitoring in the area; results from this sampling will be carefully reviewed to determine if hurricane impacts remain or if conditions have returned to normal.

Results of sampling following Hurricane Rita were similar to those found among the north shore tributaries of Lake Pontchartrain. Dissolved oxygen concentrations in many parts of the impacted area were well below criteria. In addition, chloride concentrations were elevated due to the very high and extensive storm surge which occurred along the coast. Due to the extremely flat, marshy terrain of

southwest Louisiana, this storm surge extended as much as 30 miles inland in some locations. Organic compound concentrations were generally below detection, with less than 0.3% of samples exhibiting detectable concentrations.

One of the greatest challenges that the State of Louisiana will face in 2006 and for several years to come is how to coordinate the various coastal programs into a cohesive approach for restoration. The potential of real collaboration among the Coastal Restoration Program, the water quality and habitat protection programs, the management of cypress-tupelo forests, and the rebuilding of the City of New Orleans and the other coastal communities is great, but it will take the combined efforts of many governmental entities and the general public to make it happen. Smart growth combined with wetland protection and restoration will provide additional benefits to coastal water quality and habitats, all of which are related to the goals of watershed protection.

